



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,253	01/28/2004	Clifford H. Ray	021120.0040.000	4153

7590 01/08/2007  
Mark A. Tidwell  
Jackson Walker L.L.P.  
Suite 2100  
112 E. Pecan Street  
San Antonio, TX 78205-1521

EXAMINER
----------

HUGHES, SCOTT A

ART UNIT	PAPER NUMBER
----------	--------------

3663

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/766,253

Applicant(s)

RAY ET AL.

Examiner

Scott A. Hughes

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29, 69-71, 91 and 92 is/are pending in the application.
- 4a) Of the above claim(s) 18, 69-71, 91 and 92 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 19-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/30/2006 has been entered.

### ***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-17 and 19-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

Art Unit: 3663

convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The independent claims contain the limitation that "each of said elements (a-e or a-c) include an electrical connection and all electrical connections between any elements (a-e or a-c) are contained within said housing."

Element a) is a non-spherical case formed of a single housing. There is nothing in the specification that describes this case as having an electrical connection. Applicant does not specifically point out wherein the specification there is support for the limitations added to the claims by amendment, and a search of the specification did not show any support for the limitation that the case has an electrical connection. It appears that the case contains the electrical connections between the elements disposed inside of the case, but that the case itself does not have an electrical connection that connects it to the elements disposed inside the case.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-11, 14-15, 19, 21, 26-27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Thornhill (4292861).

With regard to claim 1, Thornhill discloses a land based seismic data collection unit (abstract) (Figs. 1-2). Thornhill discloses a non-spherical case formed of a single housing 12, the case having a wall defining an internal compartment within the housing (Figs. 2-9) (Column 2, Line 1 to Column 3, Line 30). Thornhill discloses at least one geophone 66 disposed within the housing (Fig. 2) (Column 2, Lines 1-68). Thornhill discloses a clock 60 disposed within the housing (Column 6, Lines 25-58). Thornhill discloses a power source 58 disposed within the housing (Figs. 2-3) (Column 2, Lines 29-45). Thornhill discloses a seismic data recorder 60 disposed within the housing (Column 2, Line 53 to Column 3, Line 20). Thornhill discloses that each of the elements a-e (as best understood by the examiner with the casing not containing an electrical connection which allows it to be electrically connected to the other elements) includes an electrical connection and all electrical connections between any elements are contained within the housing (Column 2) (Figs. 2-5).

With regard to claim 2, Thornhill discloses that the unit is self-contained and requires no external communications or controls during recording (Columns 2-3) (Figs. 1-5).

With regard to claim 4, Thornhill discloses that the case comprises a first plate having a first periphery and a second plate having a second periphery, wherein the plates are joined along their peripheries by the wall (Figs. 1-5).

With regard to claim 5, Thornhill discloses that the case is defined by at least one substantially flat wall (ends of casing and plate 36) (Figs. 1-5).

With regard to claim 6, Thornhill discloses that the geophone is disposed adjacent to the flat wall (adjacent to the flat wall 36).

With regard to claim 7, Thornhill discloses that the case is defined by at least one plate (ends of housing and plate 36) (Figs. 1-5).

With regard to claim 8, Thornhill discloses that the geophone is disposed adjacent to the plate (Fig. 2).

With regard to claim 9, Thornhill discloses a land based seismic data collection unit (abstract) (Figs. 1-2). Thornhill discloses a non-spherical case formed of a single housing 12, the case having a wall defining an internal compartment within the housing (Figs. 2-9) (Column 2, Line 1 to Column 3, Line 30). Thornhill discloses at least one geophone 66 disposed within the housing (Fig. 2) (Column 2, Lines 1-68). Thornhill discloses a clock 60 disposed within the housing (Column 6, Lines 25-58). Thornhill discloses a power source 58 (Figs. 2-3) (Column 2, Lines 29-45). Thornhill discloses a seismic data recorder 60 disposed within the housing (Column 2, Line 53 to Column 3, Line 20). Thornhill discloses that each of the elements a-e (as best understood by the examiner with the casing not containing an electrical connection which allows it to be electrically connected to the other elements) includes an electrical connection and all electrical connections between any elements are contained within the housing (Column 2) (Figs. 2-5).

With regard to claim 10, Thornhill discloses that the unit is self-contained and requires no external communications or controls during recording (Columns 2-3) (Figs. 1-5).

Art Unit: 3663

With regard to claim 11, Thornhill discloses that the power source is disposed within the case (Figs. 2-3) (Column 2, Lines 29-45).

With regard to claims 14 and 15, Thornhill discloses that the wall is not spherical or hemispherical (Figs. 1-3). The walls of Thornhill are cylindrical and flat.

With regard to claim 19, Thornhill discloses a tilt meter disposed within the case (abstract; Columns 4-5).

With regard to claim 21, Thornhill discloses a radio unit 22 (Figs. 1-2) (Column 3).

With regard to claim 26, Thornhill discloses a radio frequency identification 22 (Columns 2-3).

With regard to claim 27, Thornhill discloses that the power source provides all power to the unit while deployed (Column 2, Lines 35-45). Thornhill discloses the power source and states that the device is not externally connected to anything else during deployment, and therefore the power source provides all power to the unit.

With regard to claim 29, Thornhill discloses an internal control mechanism 60 for controlling all functions of the unit while deployed (Column 2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 16-17 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornhill as applied to claims 1-2, 4-11, 14-15, 19, 21, 26-27, and 29 above, and further in view of Orban (6353577).

With regard to claim 3, Thornhill does not disclose that the case is watertight. Thornhill discloses that the device has openings which allow the geophone to penetrate the earth to sense seismic signals. Orban teaches that seismic sensors can be coupled to the earth to sense seismic signals while being fixed inside of the housing of the device containing the geophone (Figs. 1, 4, 6-7) (Columns 3-6). It would have been obvious to modify Thornhill to use the enclosed case with a geophone inside that gets coupled to the ground (thereby being a watertight case) instead of having to implant the geophone in order to ensure coupling of the geophone to the earth for sensing seismic waves while keeping the geophone in the protective casing.

With regard to claim 16, Thornhill does not disclose that the case defines an external surface, and the external surface is provided with ridges to enhance coupling of the unit with the earth. Thornhill discloses that the geophone is implanted into the earth to couple it with the earth after the device is settled on the surface. Orban teaches that seismic sensors can be coupled to the earth to sense seismic signals while being fixed inside of the housing of the device containing the geophone (Figs. 1, 4, 6-7) (Columns 3-6). Orban teaches that the surface of the case that contains the geophones and electronics can have ridges that enhance coupling of the unit to the earth (Column 6, Lines 1-25).



With regard to claim 17, Orban teaches that the case defines an external surface and that the external surface is provided with at least one spike 64 (Figs. 6-7) to enhance coupling with the earth (Column 6, Lines 1-25).

With regard to claim 24, Thornhill does not disclose an external connector in electrical communication with the geophone, the connector extending through the wall of the case and disposed within the wall so as to be set in from the external surface of the wall. Thornhill discloses that the unit communicates via radio antenna, but does not disclose an external connector. Orban teaches using an external connector 22 in electrical communication with geophones in a housing, the connector being set in the surface of the casing (Figs. 4-7) (Column 3, Lines 29-55; Column 5, Line 60 to Column 6, Line 25). It would have been obvious to modify Thornhill to include an external connector as taught by Orban in order to allow the geophone unit to connect to other geophone units in the area to form a seismic network.

With regard to claim 25, Orban teaches a water tight, pressure resistant cap disposed over the external connector (Figs. 4-7) (Column 3, Lines 29-55; Column 5, Line 60 to Column 6, Line 25). The connection must be watertight or else the electronic control package and geophones would not function.

Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornhill as applied to claims 1-2, 4-11, 14-15, 19, 21, 26-27, and 29 above, and further in view of Harmon.

With regard to claim 12, Thornhill does not disclose that that power source includes a fuel cell attached to the case. Thornhill discloses batteries as the power source. Harmon discloses that fuel cells are an alternative to batteries and that they can be used as an external power source attached to a device (Column 6, Lines 55-60). It would have been obvious to modify Thornhill to use a fuel cell instead of a battery as a power source in order to have a longer lasting source of power.

With regard to claim 13, Thornhill does not disclose that the power source includes a solar cell attached to the case. Thornhill discloses batteries as the power source. Harmon discloses that solar cells are an alternative to batteries and that they can be used as an external power source attached to a device (Column 6, Lines 55-60). It would have been obvious to modify Thornhill to use a solar cell instead of a battery as a power source in order to have a renewable power source that is easily rechargeable.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thornhill as applied to claims 1-2, 4-11, 14-15, 19, 21, 26-27, and 29 above, and further in view of Wood.

With regard to claim 20, Thornhill does not disclose a GPS location transducer. Wood discloses that GPS receivers are used with geophones to determine the position from which the seismic data was recorded (abstract). It would have been obvious to modify Thornhill to use GPS so that the device could be located and the data it obtains matched to its position after its deployment to the surface of the earth.

Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornhill as applied to claims 1-2, 4-11, 14-15, 19, 21, 26-27, and 29 above, and further in view of Sternberg.

With regard to claim 22, Thornhill does not disclose that the clock is a crystal clock. Sternberg discloses the use of crystal clocks in a seismic recording system (Column 6, Lines 33-52). It would have been obvious to modify Thornhill to include a crystal clock as disclosed by Sternberg in order to have a stable clock in order to maintain timing accuracy.

With regard to claim 23, Thornhill does not disclose that the clock is a rubidium clock. Sternberg discloses the use of rubidium clocks in a seismic recording system (Column 6, Lines 33-52). It would have been obvious to modify Thornhill to include a rubidium clock as disclosed by Sternberg in order to have a stable clock in order to maintain timing accuracy.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thornhill as applied to claims 1-2, 4-11, 14-15, 19, 21, 26-27, and 29 above and further in view of Donoho.

With regard to claim 28, Thornhill discloses that the power source is a battery (Column 2, Lines 35-45). Donoho teaches that lithium-ion batteries are used in seismic data acquisition units containing geophones (Column 6, Lines 39-48), and therefore it would have been obvious to use a lithium-ion battery in Thornhill in order to have a reliable power source that does not need to be recharged.

**Conclusion**

The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
SAH

  
JACK KEITH  
SUPERVISORY PATENT EXAMINER